

Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Dielectric spectroscopy of pulsed laser deposited type Pb(Zr,Ti)O₃ (PZT)/CoFe₂O₄ (CFO) and CFO/ PZT multilayers thin films. NORA ORTEGA, N. BASKARAN, R. KATIYAR, University of Puerto Rico, I. TAKEUCHI, University of Maryland — Multiferroics are a novel class of next generation multifunctional materials. Intensive research is being pursued towards the development of materials with high magnetoelectric (ME) coupling. In case of composite thin films, ferromagnetic (FM) columns epitaxially grown in ferroelectric (FE) matrix, exhibit large ME coefficient compared to multilayers structures. From the studies it appears that the distribution of FM phase in FE matrix plays an important role to obtain high ME effect. In the present work we fabricated composite thin films of FE Pb(Zr,Ti)O₃ (PZT) and FM CoFe₂O₄ (CFO) multilayers with 3,5, and 9 layers PZT/CFO (PC) and CFO/PZT (CP) by pulsed laser deposition. We have investigated the effect of reversing the order of FE and FM layers in the multilayer configuration on the properties. The TEM and XPS depth profile of the films, showed that the layer structure was not maintained. The dielectric constant of PC and CP multilayers showed strong frequency dispersion. Reversing the multilayers configuration from CP to PC resulted in increasing the remanent polarization. The observed dielectric relaxation has been explained by Maxwell-wagner type contributions. The ME effect of multilayer films will be discussed.

Nora Ortega
University of Puerto Rico

Date submitted: 02 Dec 2006

Electronic form version 1.4